



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/318,682	05/25/1999	ANIL M. MURCHING	6748-US	1767

7812 7590 03/10/2004

SMITH-HILL AND BEDELL
12670 N W BARNES ROAD
SUITE 104
PORTLAND, OR 97229

EXAMINER

CHAWAN, SHEELA C

ART UNIT	PAPER NUMBER
----------	--------------

2625

DATE MAILED: 03/10/2004

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/318,682

Applicant(s)

MURCHING ET AL.

Examiner

Sheela C Chawan

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicants' arguments filed on Aug 29, 2003 (paper # 10 C) have been fully considered but are deemed to be moot in view of the new grounds of rejection. As nescicated by the applicant amendment.

Claim Rejections - 35 U.S.C. § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103[®] and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1- 5, are rejected under 35 U.S.C. 103(a) as being unpatentable over Myers et al. (US. 6,278,460 B1) in view of Pfeiffer et al. (US.5,960,097).

Art Unit: 2625

As per claims 1 and 4, Myers discloses a method of performing semi-automatic tracking (column 1, lines 56-57) of colored objects (column 4, lines 14- 25) within a video image sequence comprising the steps of (column 6, lines 34- 47, column 10, lines 32- 49) :

separating objects within an initial frame of the video image sequence on the basis of color (column 8, lines 23 – 45, column 10, lines 32- 49);

receiving a user –provided (column 1, lines 30- 43) input that selects an object of interest from the separated objects by a user identifying a centroid (column 9, lines 15- 26) of the object of interest (column 2, lines 57- 67, column 3, lines 1-15, column 6, lines 33- 55); and

Myers differs from claims 1 and 4 in that he does not clearly disclose tracking the object of interest through successive frames of the video image sequence using a Kalman predictive algorithm applied to the centroid.

Pfeiffer discloses a background adaptive target detection and tracking with multiple observation and processing stages the system comprises of:

tracking the object of interest through successive frames of the video image sequence using a Kalman predictive algorithm applied to the centroid (column 3, lines 52- 53, column 8, lines 55- 67, column 64, lines 28- 42). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Myers to include a tracking the object of interest through successive frames of the video image sequence using a Kalman predictive algorithm applied to the centroid . It would have been obvious to one of ordinary skill in the art at the time of the invention to have

Art Unit: 2625

modified Myers by the teaching of Pfeiffer in order to improve the estimate range and range rate data which is associated line-of-sight state vector(as suggested by Pfeiffer at column 10, lines 46- 53).

As to claim 2, Myers discloses the method wherein the tracking step comprises the steps of :

from the initial frame (column 2, lines 57- 67) determining a position and velocity for the centroid (column 4, lines 48- 61, column 6, lines 16-33, 48- 55);

for each successive frame predicting a position of the centroid (column 6, lines 16-33,48-55, column 9, lines 3-11);

from the predicted position extracting a connected group of blocks that belong to the object of interest (column 9, lines 52-64);

measuring the position of the centroid in the successive frame from the connected group of blocks (column 9, lines 15-26); and

smoothing the measured position and velocity of the centroid (fig 4 and fig 8 , column 10, lines 32-68, column 11, lines 1-19,).

As per claim 3, Myers discloses the method comprising the steps of:

detecting whether the centroid in the successive frame is within the object of interest and field of view (column 6, lines 16-33,48-55, column 9, lines 3-11); and

applying an error recovery scheme to re-identify the object of interest in the successive frame (column 2, lines 57-67, column 3, lines 1-9, column 9, lines 27- 67, column 14, lines 50-56).

Art Unit: 2625

As per claim 5, Pfeiffe discloses the method according to claim 4, wherein step (c) includes the steps of determining the position of a centroid of the selected object and applying the Kalman predictive algorithm to the centroid (column 72, lines 65-67, column 73, lines 1-6).

3. Claims 6-10, are rejected under 35 U.S.C. 103(a) as being unpatentable over Myers et al. (US. 6,278,460 B1) in view of Pfeiffer et al. (US.5,960,097), as applied to the claims1-5 above and further in view of Trew et al.(US. 5,280,530).

Regarding claim 6, Myers modified by Pfeiffer teaches Kalman predictive algorithm to the centroid, but they are silent about color function of the selected object. However, Trew discloses a method and apparatus for tracking a moving object . The system comprises of :

The method wherein step (c) includes the steps of determining the position of a centroid based on a color function of the selected object (column 4, lines 3-11, 25- 27 , column 11, lines 56- 61). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified, Myers to include color function of the selected object . It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Myers by the teaching of Trew in order to improve the performance, the template update and prediction may be encapsulated within a Kalman filter. This gives the additional feature of tracking and prediciting illumination changes in the actual image (as suggested by Trew at column 10, lines 51- 59).

As per claim 7, Trew discloses the method wherein step (c) includes the steps of determining the position of a centroid based on luminance of the selected object (

Art Unit: 2625

column 3, lines 19- 27, column 5, lines 4- 28). Trew is silent about applying the Kalman predictive algorithm to the centroid. However, Pfeiffer discloses a background adaptive target detection and tracking with multiple observation and processing stages in which vector is used to update the line of sight using Kalman algorithm to predicted position and velocity of the object , column 3, lines 52- 53, column 8, lines 55- 67, column 64, lines 28- 42, column 72, lines 65-67, column 73, lines 1-6).

As per claim 8, Trew discloses the method wherein each image frame is resolved into multiple blocks and step (a) comprises the step of segmenting the initial frame based on color of the blocks (column 11, lines 49- 61).

As per claim 9, Trew discloses the method wherein step (b) includes the step of identifying a color model (column 10, lines 51-60) to which the selected object belongs and step (c) includes the steps of:

predicting the position of a centroid (column 4, lines 25- 27 , column 5, lines 29- 37) , of the selected (column 5, lines 22- 24) object in a subsequent frame (column 4, lines 50-65) ,

determining whether the predicted position of the centroid in said subsequent frame is within a boundary of the selected object in said subsequent frame (column 5, lines 29- 37, column 10, lines 25- 60); and,

in the event that the predicted position of the centroid told in said subsequent frame is not within the boundary of the selected object in said subsequent frame (column 10, lines 25 - 60) , carrying out a search to identify a block that belongs to the selected color model (column 7, lines 15- 44).

Art Unit: 2625

As per claim 10, Trew discloses the method wherein each image frame is resolved into multiple blocks and step (c) comprises the steps of :

determining position and velocity of a centroid of the selected object in the initial frame (note, updating the current picture or initial frame , column 5, lines 29- 37, column 10, lines 25- 60) ,

predicting (column 3, lines 55 - 64) the position of the centroid in a subsequent frame (column 4, lines 25- 27 , column 5, lines 29- 37),

from the predicted position (column 3, lines 61- 68) of the centroid in said subsequent frame (column 4, lines 51- 65), extracting a connected group of blocks in said subsequent frame that belong to the selected object (column 7, lines 15- 44) , and

calculating the positional of the centroid of the selected object in said subsequent frame from the connected group of blocks (column 5, lines 22- 44).

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP, 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Art Unit: 2625

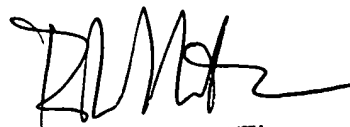
Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is 703-305- 4876. The examiner can normally be reached on Monday through Thursday 7.30 a.m. to 6.00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (703) 308 - 5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3800.


Sheela Chawan
Patent Examiner
Group Art Unit 2625
Feb 27, 2004


BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600